

Appl. No. : 09/650,122
Filed : August 29, 2000

AMENDMENTS TO THE CLAIMS

Please amend the Claims as follows. Insertions are shown underlined while deletions are ~~struck through~~.

1 (currently amended): A multi-chamber load-locking device for transferring wafers, said device having an interior divided into (i) an upper chamber and (ii) a lower chamber, and (iii) an intermediate section located between the upper chamber and the lower chamber, which is for loading/unloading wafers,

said device comprising (a) a single divider plate having an upper side and a lower side, both of which are for temporarily supporting wafers, said plate moving reciprocally between an upper position and a lower position, wherein the plate divides and seals the upper chamber from the intermediate section and the lower chamber at the upper position, and the plate divides and seals the lower chamber from the intermediate section and the upper chamber at the lower position, wherein each of the upper chamber and the lower chamber has a sealing surface where the upper chamber and the lower chamber are sealed with the plate, said sealing surface being formed by an O-ring; (b) a cylindrical cam structure co-axially connected to said plate, wherein said plate moves between the first position and the second position by rotation of the cylindrical cam structure; and (c) a rotary actuator for rotating the cylindrical cam structure,

said cam structure comprises (1) a cam cylinder having a cam groove which rotates with the rotary actuator, and (2) a support cylinder having a cam follower which support cylinder is attached to the plate and does not rotate, wherein the cam follower is fitted in the cam groove and moves vertically when the cam groove rotates, said support cylinder being provided inside the cam cylinder, wherein the plate, the cam cylinder, the support cylinder, and the rotary actuator are co-axial,

said groove spiraling around a circumference of the cylinder, said groove comprising (I) an upper horizontal section for locking the plate at the upper position, where the cam follower is securely locked in the cam groove, (II) a lower horizontal section for locking the plate at the lower position where the cam follower is securely locked in the cam groove, (III) a straight middle section for moving the plate at a fixed rate, (IV) an upper transition section connecting the upper horizontal section and the straight middle section for moving the plate at a rate lower than the fixed rate, and (V) a lower transition section connecting the lower horizontal section and

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the straight middle section for moving the plate at a rate lower than the fixed rate, wherein the length of each section in a horizontal direction is $(I) < (IV) < (III) > (V) > (II)$,

said device further comprising (d) a vertical beam provided in parallel to the axis of the cam cylinder, and (e) a sliding support which is affixed to the support cylinder and slides on the beam when the support cylinder moves vertically.

2-6 (cancelled)

7 (original): The device as claimed in Claim 1, which is adapted to be disposed between a loading station which places a wafer cassette accommodating semiconductor wafers, and a transfer chamber which conveys the semiconductor wafers, wherein the intermediate section is connected to the transfer chamber, and the upper chamber and the lower chamber are connected to the loading station.

8-11 (cancelled)

12 (new): The device as claimed in Claim 1, wherein the vertical beam is disposed opposite to the cam follower with respect to the axis of the cam cylinder, the support cylinder, and the rotary actuator.

13 (new): The device as claimed in Claim 1, wherein the groove spirals around substantially one circumference of the cylinder.

14 (new): The device as claimed in Claim 1, wherein the cam cylinder and the cam follower are made of indent treated carbon steel.